

IN THE CLAIMS

Claim 1 (Previously Presented): An aqueous suspension comprising a component (1) comprising one or more pigments, fillers or minerals, and optionally (2) a dispersant polymer, wherein,

a) said component (1) comprises a natural carbonate and the reaction product or products of said carbonate with gaseous CO_2 and one or more medium-strong to strong H_3O^+ ion-providers,

b) wherein said suspension has a pH greater than 7.5 measured at 20° C, and wherein paper filled or coated by treating with said suspension, at a constant area and thickness, weighs less than paper treated with said suspension but without said reaction products,

wherein the natural carbonate is a natural calcium carbonate (CaCO_3), and

wherein the quantity in moles of the one or more medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claim 2 (Cancelled).

Claim 3 (Previously Presented): The aqueous suspension according to Claim 1, wherein the strong H_3O^+ ion-provider is selected from the group consisting of hydrochloric acid, sulphuric acid and mixtures thereof, and the medium-strong H_3O^+ ion-provider is selected from the group consisting of H_2SO_3 , HSO_4^- , H_3PO_4 , oxalic acid and mixtures thereof.

Claim 4 (Cancelled).

Claim 5 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of between $5 \text{ m}^2/\text{g}$ and $200 \text{ m}^2/\text{g}$.

Claim 6 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 50 and 0.1 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $15 \text{ m}^2/\text{g}$ to $200 \text{ m}^2/\text{g}$.

Claim 7 (Previously Presented): The aqueous suspension according to Claim 6 wherein the pigment, filler or mineral has the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 7 and 0.7 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 8 (Cancelled).

Claim 9 (Currently Amended): A process for treating pigments, fillers or minerals in an aqueous suspension, wherein said pigments, fillers, or minerals comprise a natural carbonate, the process comprising

treating said pigments, fillers or minerals, in an aqueous suspension, with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 to provide the treated pigments, fillers or minerals,

wherein the final pH of the suspension is greater than 7.5 when measured at 20 °C,

wherein a paper filled or coated with the treated pigments, fillers, or minerals weighs less than a paper ~~treated~~ filled or coated with the pigments, fillers or minerals that have not been treated with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 , a non-treated filler, wherein both the paper treated with the treated pigments, fillers or minerals and the paper treated with the pigments, fillers or minerals that have not been treated with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 ~~non-treated filler~~ have equal areas and thicknesses,

wherein the natural carbonate is a natural calcium carbonate (CaCO_3), and

wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claim 10 (Previously Presented): The process according to Claim 9, wherein the gaseous CO_2 comes from an external CO_2 supply, from the recirculation of CO_2 , from the continuous addition of the same or another medium-strong to strong provider of H_3O^+ ions as used in the treatment, or from an excess pressure of CO_2 .

Claim 11 (Currently Amended): A process for treating pigments, fillers or minerals in an aqueous suspension, comprising:

- a) treating the pigments, fillers or minerals with one or more medium-strong to strong providers of H_3O^+ ions
- b) treating the product of a) with gaseous CO_2 , and

- c) raising of the pH of the product of b) beyond 7.5, measured at 20° C, in a time interval after the end of stages a) and b) of between 1 hour and 10 hours without addition of a base, or immediately after the end of stages a) and b) with the addition of a base,

wherein the a paper filled or coated with the treated pigments, fillers, or minerals weighs less than a paper ~~treated~~ filled or coated with the pigments, fillers or minerals that have not been treated with a combination of one or more medium-strong to strong H₃O⁺ ion-providers and gaseous CO₂ ~~a non-treated filler~~,

wherein both the paper ~~treated~~ filled or coated with the treated pigments, fillers, or minerals and the paper ~~treated~~ filled or coated with the pigments, fillers, or minerals that have not been treated with a combination of one or more medium-strong to strong H₃O⁺ ion-providers and gaseous CO₂ ~~non-treated filler~~ have equal areas,

wherein the pigments, fillers or minerals comprise a natural calcium carbonate (CaCO₃), and

wherein the quantity in moles of the one or more medium-strong to strong providers of H₃O⁺ ions relative to the number of moles of CaCO₃ is in total between 0.1 and 2.

Claim 12 (Previously Presented): The process according to Claim 11, wherein stages a) and b) may be repeated several times.

Claim 13 (Previously Presented): The process according to Claim 11, wherein the pH measured at 20° C is between 3 and 7.5 during stages a) and b) of the treatment and the treatment temperature is between 5° C and 90° C.

Claims 14-15 (Cancelled).

Claim 16 (Previously Presented): The process according to Claim 11, wherein the duration of stage b) of the treatment is between 0 hours and 10 hours.

Claim 17 (Currently Amended): A process for treating pigments, fillers or minerals in an aqueous suspension, wherein said pigments, fillers, or minerals comprise a natural carbonate (CaCO_3), the process comprising

treating said pigments, fillers or minerals, in an aqueous suspension, with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 to provide the treated pigments, fillers or minerals,

wherein the final pH of the suspension is greater than 7.5 when measured at 20 °C,

wherein a paper filled or coated with the treated pigments, fillers, or minerals weighs less than a paper ~~treated~~ filled or coated with the pigments, fillers or minerals that have not been treated with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 ~~a non-treated filler~~, wherein both the paper filled or coated ~~treated~~ with the treated pigments, fillers or minerals and the paper filled or coated ~~treated~~ with the ~~non-treated filler~~ pigments, fillers or minerals that have not been treated with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 have equal areas and thicknesses,

wherein the pigments, fillers, or minerals comprising a natural carbonate are selected from the group consisting of a natural carbonate, a carbonate containing a dolomite, a mixture of a natural carbonate with at least one substance, a mixture of a carbonate containing a dolomite with at least one substance, and mixtures thereof; wherein the at least one substance is selected from the group consisting of talc, kaolin, titanium oxide (TiO_2), magnesium oxide

(MgO), a mineral inert towards medium-strong H_3O^+ ion-providers, and mixtures thereof,
and

wherein the quantity in moles of the one or more medium-strong to strong providers of H_3O^+ ions relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claim 18 (Previously Presented): The process according to Claim 17, comprising the natural carbonate, wherein the natural carbonate is a marble, a calcite or a chalk.

Claim 19 (Previously Presented): The process according to Claim 9, wherein the strong provider or providers of H_3O^+ ions is hydrochloric acid or sulphuric acid and the medium-strong provider or providers of H_3O^+ ions is selected from the group consisting of H_2SO_3 , HSO_4^- , H_3PO_4 , oxalic acid, and combinations thereof.

Claim 20 (Previously Presented): The process according to Claim 11, further comprising the addition of a dispersing agent, and optionally a reconcentration, after c).

Claim 21 (Currently Amended): A treated aqueous suspension comprising treated pigments, fillers, or minerals,

wherein the treated pigments, fillers, or minerals comprise a natural carbonate,

wherein the natural carbonate is a natural calcium carbonate (CaCO_3) selected from the group consisting of a natural calcium carbonate, a natural calcium carbonate containing a dolomite, a mixture of a natural calcium carbonate with at least one substance, a mixture of a natural calcium carbonate containing a dolomite with at least one substance, and mixtures thereof; wherein the at least one substance is selected from the group consisting of talc,

kaolin, titanium oxide (TiO_2), magnesium oxide (MgO), a mineral inert towards medium-strong H_3O^+ ion-providers, and mixtures thereof; and

wherein the treated aqueous suspension is produced by a process comprising treating said pigments, fillers or minerals, in an aqueous suspension, with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 to provide the treated pigments, fillers or minerals,

wherein the final pH of the suspension is greater than 7.5 when measured at 20 °C,

wherein a paper filled or coated with the treated pigments, fillers, or minerals weighs less than a paper ~~treated~~ filled or coated with the pigments, fillers, or minerals that have not been treated with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 ~~a non-treated filler~~,

wherein both the paper treated with the treated pigments, fillers or minerals and the paper treated with the pigments, fillers, or minerals that have not been treated with a combination of one or more medium-strong to strong H_3O^+ ion-providers and gaseous CO_2 ~~non-treated filler~~ have equal areas and thicknesses,

wherein the quantity of moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.1 and 2.

Claims 22-23 (Cancelled).

Claim 24 (Previously Presented): The aqueous suspension of Claim 1, further comprising a dispersant polymer.

Claim 25 (Previously Presented): A process for coating paper comprising applying the aqueous suspension as claimed in Claim 1 onto a sheet of paper.

Claim 26 (Previously Presented): A process for making a paper sheet with a paper filler,

the process comprising:

diluting a wood and fibre pulp or paste, with water, in the presence of the aqueous suspension of Claim 1 to form a mixture,

agitating the mixture, and

forming the paper sheet from the mixture.

Claim 27 (Previously Presented): The process of Claim 26, further comprising, after forming the paper sheet, drying the formed paper sheet.

Claim 28 (Previously Presented): The process as claimed in Claim 26, further comprising, after agitating the mixture, adding a retaining agent.

Claim 29 (Previously Presented): A paint comprising the aqueous suspension of Claim 1 and a latex.

Claim 30-33 (Cancelled).

Claim 34 (Previously Presented): A process for manufacturing a sheet of paper or board,

the process comprising:

diluting a pulp or paste, with water, in the presence of the aqueous suspension of Claim 1 to form a mixture,

agitating the mixture, and
forming the paper sheet or board from the mixture,
wherein said paper sheet or board comprises fibres not originating from wood.

Claim 35 (Cancelled).

Claim 36 (Previously Presented): A method of printing comprising digitally applying ink onto the paper or board, wherein the paper or board is made by a process comprising diluting a pulp or paste, with water, in the presence of the aqueous suspension of Claim 1 to form a mixture,
agitating the mixture, and
forming the paper sheet or board from the mixture,
wherein said paper sheet or board comprises fibres not originating from wood.

Claim 37 (Previously Presented): The aqueous suspension claimed in Claim 1 wherein the natural calcium carbonate is selected from the group consisting of marble, calcite, chalk and carbonate containing dolomite.

Claim 38 (Previously Presented): The aqueous suspension according to Claim 1, wherein the quantity in moles of the medium-strong to strong H_3O^+ ion-providers relative to the number of moles of CaCO_3 is in total between 0.25 and 1.

Claim 39 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 40 (Previously Presented): The aqueous suspension according to Claim 1, wherein the pigment, filler or mineral has a BET specific surface area, measured in accordance with the ISO 9277 Standard, of from $30 \text{ m}^2/\text{g}$ to $60 \text{ m}^2/\text{g}$.

Claim 41 (Previously Presented): The aqueous suspension according to Claim 6, wherein the pigment, filler or mineral presents the following characteristics:

- a mean grain diameter, measured by the sedimentation method on a Sedigraph 5100™, between 25 and 0.5 micrometers, and
- a BET specific surface area, measured in accordance with ISO 9277, ranging from $20 \text{ m}^2/\text{g}$ to $80 \text{ m}^2/\text{g}$.

Claim 42 (Previously Presented): The process as claimed in Claim 10, wherein the gaseous CO_2 has a pressure of from 0.05 to 5 bars.

Claim 43 (Previously Presented): The process as claimed in Claim 11, wherein c) is the final stage in the process.

Claim 44 (Previously Presented): The process as claimed in Claim 13 wherein the treatment temperature is between 45 and 60°C .

Claim 45 (Previously Presented): The process as claimed in Claim 16 wherein the duration of stage b) of the treatment is between 2 hours and 6 hours.

Claim 46 (Previously Presented): A paint comprising the aqueous suspension of Claim 24 and a latex.

Claim 47 (Previously Presented): A process for coating paper comprising applying the aqueous suspension as claimed in Claim 21 onto a sheet of paper.

Claim 48 (Cancelled).

Claim 49 (Previously Presented): A process for coating and manufacturing a sheet of paper comprising coating and impregnating, in any order, a sheet of paper with the aqueous suspension claimed in Claim 21 wherein said aqueous suspension acts as a paper filler and as a preparation for coating and pigmentation of the surface of the paper.

Claims 50-60 (Cancelled).

Claim 61 (Previously Presented): A process for manufacturing a sheet of paper or board,

the process comprising:

diluting a pulp or paste, with water, in the presence of the treated aqueous solution of Claim 21 to form a mixture,

agitating the mixture, and

forming the sheet of paper or board from the mixture.

Claims 62-64 (Cancelled).

Claim 65 (Previously Presented): A sheet or board produced by the process of Claim 61.

Claim 66 (Previously Presented): A method of printing comprising digitally applying ink onto the paper or board claimed in Claim 65.

Claim 67 (Previously Presented): The aqueous suspension of Claim 1, comprising the at least one medium-strong H_3O^+ ion-provider.

Claim 68 (Currently Amended): The aqueous suspension of Claim 67, wherein the at least one medium-strong H_3O^+ ion-provider is selected from the group consisting of phosphoric acid, H_2SO_3 , HSO_4^- ~~hydrochloric acid, sulphuric acid, oxalic acid~~ and mixtures thereof.

Claim 69 (Previously Presented): The aqueous suspension of Claim 1, comprising the at least one strong H_3O^+ ion-provider.

Claim 70 (Currently Amended): The aqueous suspension of Claim 69, wherein the at least one strong H_3O^+ ion-provider is selected from the group consisting of H_2SO_4 , H_2SO_3 , HSO_4^- , H_3PO_4 ~~oxalic acid~~ hydrochloric acid and mixtures thereof.